Clean Air Progress Report 2019

Maryland
Department of
the Environment

Clean Air **Highlights**

Maryland's air quality continues to improve. Emissions of criteria pollutants continue to decrease because of federal and Maryland regulations, improvements in technology and good operating practices from businesses. These impacts are experienced within the state and extend throughout the northeastern states.

Clean air matters to Maryland, our neighboring states and the Chesapeake Bay, and that is why we are committed to a course of air quality improvements.

For nearly 20 years, Maryland's air quality has improved. Maryland is in compliance with federal air quality standards for four of the six criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), and particulate matter.

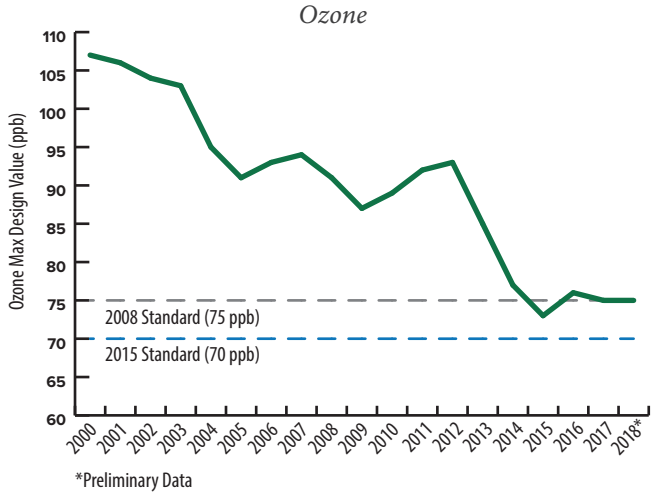
Maryland is still working to achieve the federal standard for ozone. In recent years, we have achieved the 2008 ozone standard and are close to achieving the 2015 ozone standard. In 2018, Maryland recorded the second fewest number of bad ozone days ever recorded. Two key elements affect Maryland's ability to achieve this standard: transported air pollution from other states and nitrogen oxides (NO_x) emissions, a key component for ozone formation.

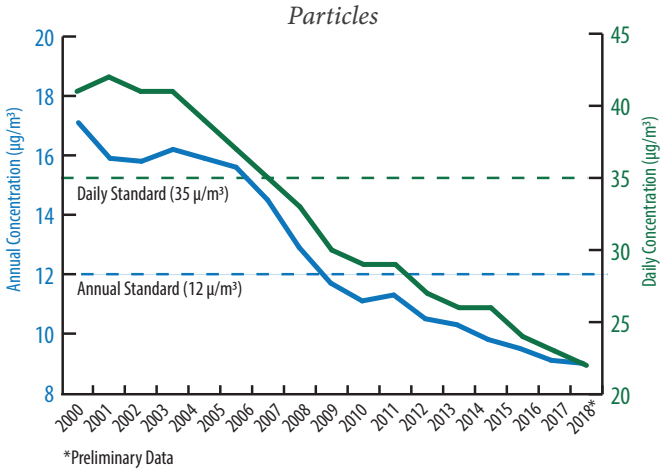
For SO_2, the one area in Maryland designated as nonattainment for the new sulfur dioxide (SO_2) NAAQS is measuring concentrations well below the standard.

Since 2010, particle levels throughout the state of Maryland have met both the daily and annual NAAQS and continue to trend down each year. The highest particulate levels in the state are 25% below the annual standard and average daily levels are even lower. Improvements in particle pollution have largely been attributed to reductions in SO_2 and NO_x from power plants and other industrial sources. The federal NO_x SIP Call regulations, Clean Air Interstate Rule (CAIR), Maryland's Healthy Air Act (HAA) and 2015 NO_x regulations for coal-fired power plants have significantly contributed to these improvements in particle air quality.

In 2018, Maryland continued to benefit from reduced NO_x emissions from power plants and other large industrial sources. Transportation programs and policies designed to reduce NO_x emissions, like the Tier 3 Vehicle and Fuel Standards, will result in significant air quality benefits. In addition to reducing emissions from specific sources, Maryland is also engaged in several legal actions designed to reduce air pollution from other states and to strengthen federal policies that are critical to support our efforts.

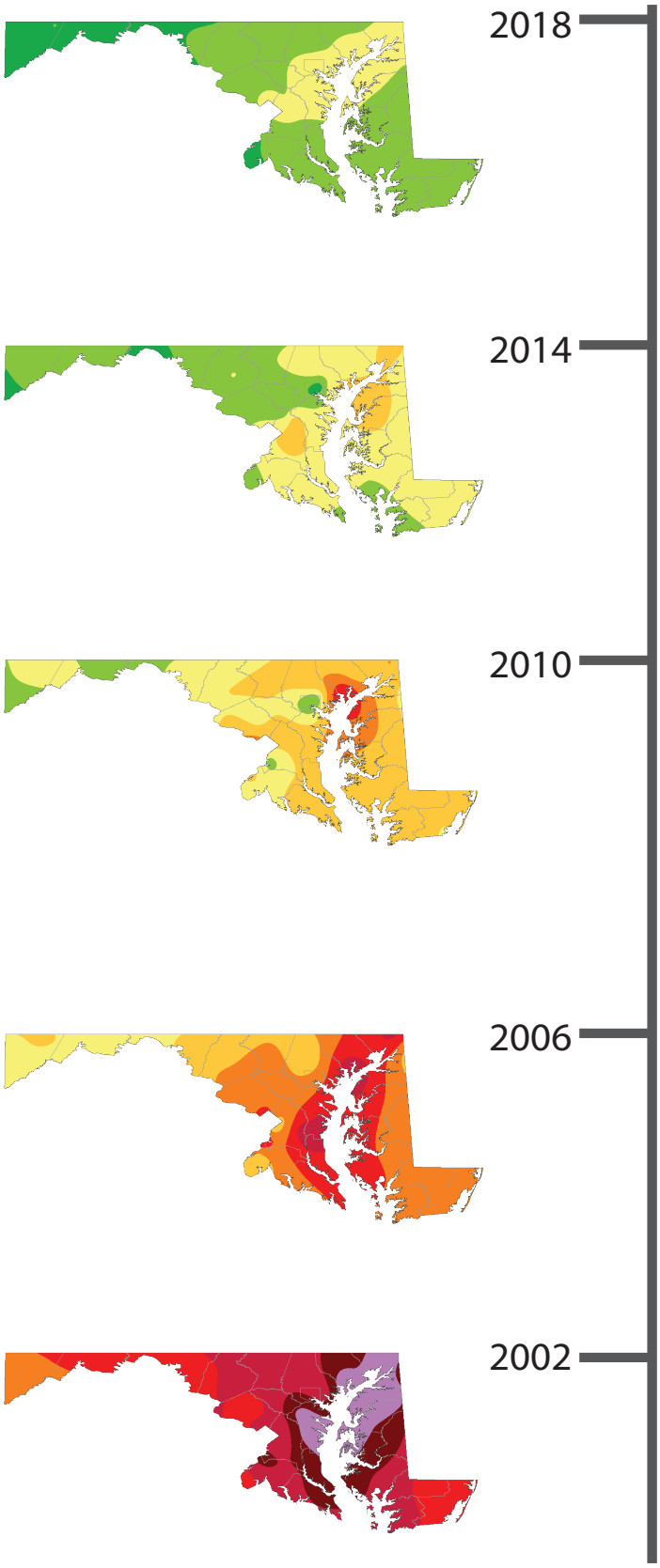
For more information about air quality in Maryland: https://mde.maryland.gov/air





Maryland's Shrinking Ozone

Multi-day ozone episodes are fewer, sporadic and briefer as regional ozone concentrations continue to decrease.



The 2018 ozone season continued the cleaner air trend. In 2018, Maryland monitors recorded ozone concentrations greater than the NAAQS of 70 parts per billion (ppb) on 16 days. The only year better than 2018 was 2014, when there were 11 days with ozone concentrations above the NAAQS. In 2018 about 40 percent of the 16 days involved just one of the 20 ozone monitors located in Maryland.

Variations in weather conditions play an important role in determining ozone concentrations. In 2014, temperatures remained cooler than normal and transport patterns were mostly unfavorable for high ozone concentrations. Overall, the 2018 ozone season had slightly above typical temperatures and experienced record rainfall.

The maps to the left illustrate the improving ozone air quality over 16 years. In 2002, the dark reds and purples indicate pervasive high ozone concentrations throughout Maryland. Improvements occurred as federal and state policies were implemented to reduce ozone forming emissions. The yellow and green dominance in recent years illustrates the success of these programs.

Major federal policies like the NO_x Budget Trading Program (implemented in 2003) and the Tier 2 Motor Vehicle Standards (phased in between 2004 and 2007) established a foundation for reducing ozone-forming emissions.

Maryland implemented the HAA in 2006. The HAA capped NO_x, SO_2, and mercury emissions from electricity generating units. This resulted in dramatic reductions in two phases: NO_x reductions in 2009 and SO_2 reductions in 2010.

The 2015 NO_x regulation requires coal-fired electricity generating units to minimize NO_x emissions every day of the ozone season by optimizing and running pollution control equipment and by lowering emission rates to achieve increasingly stringent standards by 2020.

In 2007, MDE adopted the Clean Car Program mandated by the Clean Car Act of 2007. This program requires that cars sold in Maryland be the cleanest cars allowed by law.

For more information and to find current air quality data: https://mde.maryland.gov/programs/Air/AirQualityMonitoring/Pages/index.aspx

Clean Air Projects

Legal Efforts to Address Transported Air Pollution

MDE continues to press for federal actions to reduce air pollution that blows into Maryland from upwind states. Maryland, through MDE, is part of three air pollution transport lawsuits against the U.S. Environmental Protection Agency (EPA) that were filed in the D.C. Circuit Court of Appeals.

Expanding the Ozone Transport Region

Maryland was one of several states that petitioned EPA to expand the Ozone Transport Region (OTR) by adding nine states, which would have subjected those states to the same emissions reductions efforts being adopted by OTR states. EPA denied the petition. Maryland and other states challenged this decision but the D.C. Circuit Court of Appeals upheld EPA's decision.

The Maryland 126 Petition

On October 15, 2018, Maryland sued EPA in the United States Court of Appeals for the D.C. Circuit because of EPA's decision to deny Maryland's 2016 petition under Section 126 of the Clean Air Act. The petition asked EPA to require 19 power plants with 36 generation units in five upwind states to run their already–installed pollution control technology. Maryland's 126 petition demonstrates that there are large, immediately available and cost-effective NO_x emissions reductions that can be achieved by requiring upwind power plant units, that are not currently required to run pollution controls every day, to optimize their existing control technologies every day of the ozone season. These upwind NO_x emissions contribute to the formation of ozone in Maryland.

Maryland asks for a very simple remedy: require power plants to run their controls optimally (consistent with manufacturer specifications and good engineering practices) every day of the ozone season. The ozone standard is a short-term (8-hour) standard to protect individuals from health effects that can occur over that 8-hour period. Having high emissions on days when weather conditions are favorable to the creation of high ozone levels and low emissions on other days is illogical and inconsistent with the science of ozone. Daily emission limits are critical.

Cross State Air Pollution Rule Close-Out

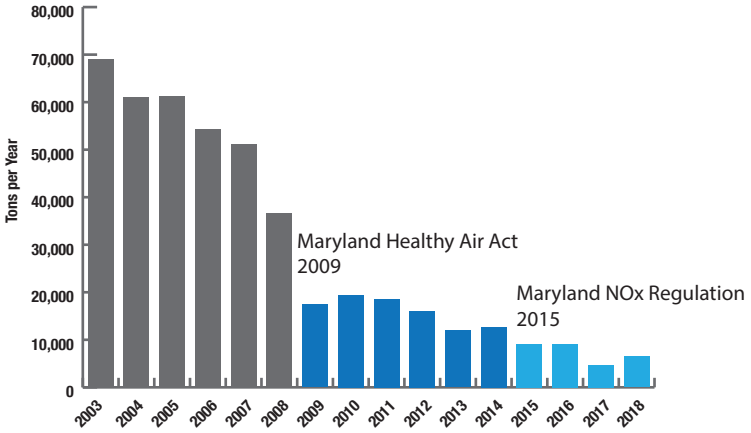
Maryland also joined many other East Coast states in challenging EPA's recently finalized Cross State Air Pollution Rule Close-Out. EPA argued that there are no controls that can be added quickly and that states will have to wait, as all ozone transport issues for the East Coast will be resolved by 2023. Maryland is required to meet ozone standards by 2020.

Maryland and other states are challenging EPA over this rule as, at a minimum, upwind power plants that have already purchased and installed high-end pollution controls, that are clearly available right now, should be required to actually run those controls every day of the ozone season. EPA's position is also inconsistent with current monitoring data and ozone modeling conducted by the states. This case is in litigation.

NO_x Reductions from Electricity Generators

Coal-fired power plants have significantly reduced NO_x emissions over the past 15 years. Federal trading programs like the NO_x Budget Trading Program / NO_x SIP Call (2003), the Clean Air Interstate Rule (2005), and the Cross State Air Pollution Rule (2011) resulted in dramatically reduced average NO_x emissions during the ozone season.

Annual NO_x Reductions at Maryland Power Plants



Beginning in 2009, Maryland's Healthy Air Act imposed strict annual and ozone season NO_x, SO_2, and mercury emissions limits on Maryland's largest power plants.

Maryland's 2015 NO_x regulation for coal-fired power plants builds on the ozone season provisions of the Healthy Air Act by requiring power plants to minimize NO_x emissions every day of the ozone season by optimizing and running pollution control equipment and by lowering emission rates to achieve increasingly stringent standards by 2020. Since this rule was implemented in 2015, Maryland's coal-fired power plants have recorded their lowest NO_x emissions ever.

Municipal Waste Combustors

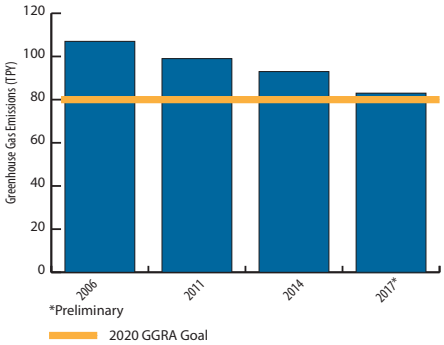
On December 6, 2018, MDE adopted updated regulations for municipal waste combustors. These new regulations require that Maryland's two large incinerators (Wheelabrator Baltimore, Inc. and Montgomery County Resource Recovery Facility) meet specific NO_x emission rates, which will result in the reduction of approximately 200 tons of NO_x emissions each year. These regulations were developed to address federal Clean Air Act statutes that require Maryland to review and revise NO_x Reasonably Available Control Technology (RACT) regulations. Maryland's RACT for municipal waste combustors is currently the most stringent among the Northeast states.

The department's regulations also require Wheelabrator Baltimore, Inc. to develop a feasibility analysis of state–of–the–art control technologies that could further reduce NO_x emissions. By January 1, 2020, Wheelabrator Baltimore, Inc. is required to submit new NO_x emission limits to MDE for consideration.

Climate Change

Maryland continued to make progress on climate change and reducing greenhouse gas (GHG) emissions in 2018. The preliminary 2017 GHG inventory required as part of the Greenhouse Gas Emission Reduction Act (GGRA) shows that Maryland is on track to achieve the 25% GHG emission reduction from 2006 levels requirement by 2020. As federal energy data is released, we may see that the state has already achieved the 2020 goal in 2017.

Gross GHG Emissions



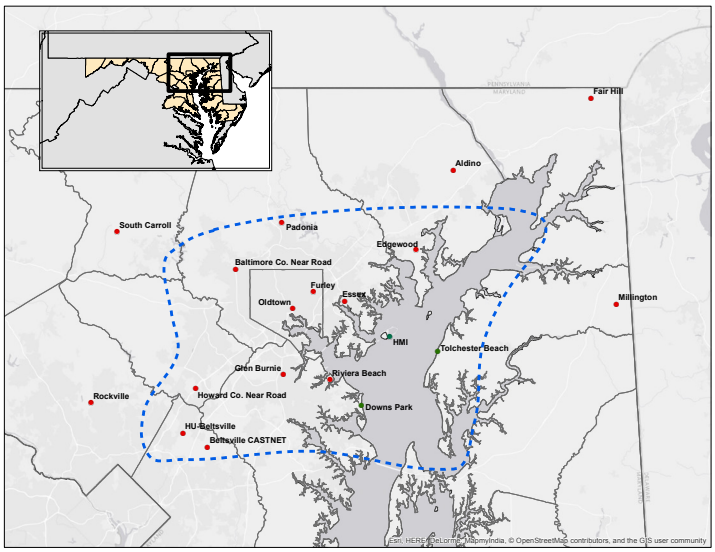
In 2019, MDE will be releasing the GGRA required draft of a plan to achieve a 40% GHG emission reduction by 2030. The 40 by 2030 plan will be finalized in 2019. The draft plan will likely drive 2030 GHG emission reductions that are greater than 40% while also supporting economic growth and new jobs in Maryland.

In 2018, Maryland adopted amendments to its regulations to implement the Regional Greenhouse Gas Initiative (RGGI), the nation's first market-based regulatory program to reduce GHG emissions. The 2018 update to the Maryland RGGI regulations adopt the program changes agreed upon by 11 RGGI states in late 2017. Under the leadership of MDE Secretary Ben Grumbles, the current RGGI Chairperson, RGGI adopted program changes that will provide an additional 30% cap reduction by the year 2030. For more information about RGGI: https://mde.maryland.gov/programs/Air/ClimateChange/RGGI/Pages/index.aspx

In December 2018, Maryland and other members of the Transportation Climate Initiative (TCI) announced a year long process to design a new regional low-carbon transportation policy. That policy would cap and reduce carbon emissions from the combustion of transportation fuels and invest proceeds from the program into low-carbon and more resilient transportation infrastructure. This initiative builds from the successful "cap-and-invest" concepts used in RGGI. Both MDE and the Maryland Department of Transportation (MDOT) are members of the TCI. For more information: https://www.georgetownclimate.org/transportation/transportation-and-climate-initiative.html

Air Quality and the Chesapeake Bay

OWLETS – 2 Study Area

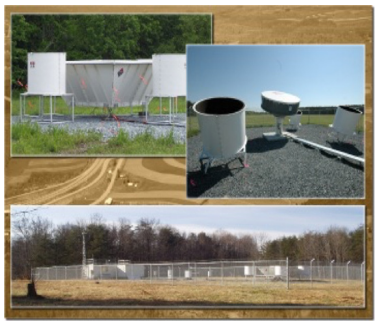


The Ozone Water-Land Environmental Transition Study (OWLETS – 2) was an intensive collaborative effort during the summer of 2018 to study air quality in and around the northern Chesapeake Bay region. MDE and scientists from NASA, NOAA, and several local universities participated in the study. The study was designed to help figure out why Maryland's and other eastern states' most problematic ozone monitors are located close to water bodies, why ozone is high over water bodies, how bay breezes push high ozone over the bay inland and what sources contribute to the high ozone readings over the bay.

Air quality measurement instrumentation was deployed at various locations in and around the bay from June 6 through July 6, 2018. These measurements provided a much needed three–dimensional look at air pollution over and surrounding the bay and will help scientists better understand how ozone is affected by the land–water interface issue.

Although recent and significant decreases in pollutant emissions have decreased the frequency and severity of local high–ozone events, ozone in Maryland continues to occasionally exceed federal standards. The OWLETS – 2 campaign was designed to help MDE and other states develop policy to address more recent ozone events. Again, more recent ozone events are generally less frequent and less severe. They will often involve a single monitor close to the Bay reading high. Understanding the land-water interface is critical to knowing how the complex mix of sources, including cars, trucks, power plants, industries, peaking energy units, and marine engines, contributed to high ozone in 2018.

Surface and aloft pollutant measurements were taken by an assortment of instrumentation. The MDE air monitoring network provided a foundation for surface ozone measurements. Aloft ozone measurement technologies included Light Detection and Ranging (LIDAR) remote sensing, ozonesondes, tethered balloons, aircraft, satellites, a wind LIDAR called a wind cube, radiometers, and ceilometers. Additional surface measurements included fine particles, carbon monoxide, NO_x, mercury, SO_2, and volatile organic compounds. These instruments were located at sites from approximately the Bay Bridge to Aberdeen Proving Grounds. Hart-Miller Island and the University of Maryland – Baltimore County served as the study's super sites within the greater experimental network. OWLETS – 2 provided a much needed and unique opportunity to take a combination of air quality measurements over and around the Chesapeake Bay.



Radar Wind Profiler

Ozonesonde

Airplane

Clean Air and Transportation

Clean Cars Program Emergency Regulation

The current greenhouse gas and fuel economy standards are the result of a synchronization of California's, EPA's and the National Highway Traffic Safety Administration's (NHTSA) programs. California's implementing regulations contained a "deem to comply" provision that allowed vehicle manufacturers that comply with the EPA program to also comply with California's program. On August 24, 2018, EPA and NHTSA proposed the Safer Affordable Fuel-Efficient (SAFE) Vehicle Rule for model years 2021-2026 passenger cars and light trucks. This proposed regulation will amend certain existing fuel economy and greenhouse gas emissions standards for these vehicles as well as establish new standards for model years 2021 through 2026. These proposed changes will weaken the program. In an effort to retain full benefits, California has subsequently removed the "deemed to comply" provision and will require compliance with its program independent of the federal program.

Maryland adopted its Clean Cars Program under Section 177 of the Clean Air Act, which provides states the ability to adopt California's program as long as the program is identical to California's and two model years lead time for implementation are provided. In order to remain consistent with California, MDE had to change its regulations to remove the "deemed to comply" provision. This rule-making was undertaken as an emergency regulation to allow adoption by December 31, 2018, to ensure the two model year lead time.

The Volkswagen Mitigation Plan

As a result of a 2016 settlement between the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (CARB) and Volkswagen for violations of the Clean Air Act that involved software designed to defeat emissions standards, Volkswagen is required to spend $2.7 billion on emission reduction programs nationwide. This software or "defeat device" allowed cars to meet emissions standards in a laboratory or a testing station, but during normal operation those vehicles emitted NO_x at up to 40 times the standard. Approximately 16,000 of the affected vehicles were sold in Maryland, negatively impacting the state's air quality. MDE estimates that the illegal vehicles emitted up to 1,730 tons of excess NO_x – the equivalent of an additional 375,000 vehicles on Maryland roads each day.

Under the Environmental Mitigation Trust established in the 2016 settlement, Maryland is eligible to authorize spending of $75.7 million for specifically defined mitigation projects to remediate the excess NO_x emissions. Maryland's mitigation plan was developed by MDE, MDOT, and the Maryland Energy Administration (MEA) in accordance with the list of eligible projects and matching fund requirements required under Appendix D-2 of the settlement. The plan placed priority on electric vehicle charging infrastructure – allocating the full 15% that is allowed for this category – and the replacement of older, dirty diesel engines with new, cleaner technologies. Electric buses and heavy-duty equipment such as trucks, boats and locomotives are potential projects that are eligible for funding.

MDE requested public comments on the draft plan and held public meetings in August 2018. Changes made to the draft plan in response to public comments include an increase in funding for local government projects, and the addition of a pilot program of electric school buses. The plan has been finalized and approved by the Trustee. Maryland looks forward to the implementation of these exciting projects

For more information: https://mde.maryland.gov/programs/Air/MobileSources/Pages/MarylandVolkswagenMitigationPlan.aspx

The Port Partnership

2018 was another productive year for the Port Partnership. The Maryland Port Administration (MPA), MDE, MDOT and MEA participate in this partnership.

The partnership has made great strides in implementing projects related to a number of emissions reduction grant-supported initiatives. MPA received a $2.45 million EPA Diesel Emission Reduction Act (DERA) grant, its largest ever, to continue with the replacement of dray trucks and cargo handling equipment (forklifts, yard tractors, top loaders, and cranes) as well as to repower engines in the Spirit of Baltimore cruise ship. MDE continued to provide its DERA state grant funding in support of the dray truck replacement program.

To date, over $17 million has been invested into diesel emission reduction activities at the Port of Baltimore. These projects will, over the lifetime of the equipment, reduce in excess of 2,257 tons of air pollutants including NO_x, fine particles, hydrocarbons, diesel particulate, and carbon monoxide. The emission reduction activities at the port will also result in very significant reductions in greenhouse gas emissions, primarily carbon dioxide and black carbon.

The work group continues to place a high priority on involving key stakeholders, especially communities in areas around the port. Activities to strengthen and expand stakeholder engagement on port-related air quality issues, including attending community group meetings, providing air quality improvement presentations, participating in tours for community members and including stakeholders and private port tenants in partnership meetings, are ongoing and beneficial to all.

MPA also sponsored a fellow from the Environmental Defense Fund's (EDF) Climate Corps Program to research natural gas fuel cell technologies. MPA is now in the process of deploying a natural gas fuel cell to help with energy peak savings in one of its maintenance buildings.

Idle Free MD

In 2018, MDE kicked off the Idle Free MD program. Idle Free MD is a partnership among the state, the private sector and Maryland schools, designed to reduce unnecessary idling through outreach, education and voluntary action. The goal of the program is to significantly reduce unnecessary idling by building awareness of its economic, health, and environmental effects. The program establishes partnerships with motorists, communities, and the transportation industries with the intention of reducing emissions from unnecessary idling by decreasing the social tolerance of idling through fact-based education.

Program resources are available to help spread the word about the benefits of reducing vehicle idling, including healthier land and marine life in and around the bay, lower risk from pollutants that may cause asthma and other serious illnesses, and less time and money spent on fuel and vehicle maintenance. The tools are designed to educate motorists, schools, and transportation industries on ways to reduce unnecessary idling. The campaign includes a toolkit with a variety of products, including fact sheets, social media materials, pledge sheets, posters, policies and other communications material. For more information and the toolkit: https://mde.maryland.gov/programs/Air/MobileSources/idlefreeMD/Pages/index.aspx

MDE and its state partners — MDOT and MEA — are working with several key partners to implement Idle Free MD. These include the Maryland Motor Truck Association and the Maryland State Department of Education.